REMARKS

Claim Objections

Claims 8 and 9 were objected to for informalities. The claims have been amended to remove the aforementioned informalities and are not in condition for allowance. Reconsideration is requested.

Claims rejected under 35 USC 103(a)

Claims 1, 6 and 13-15 were rejected under 35 USC 103(a) as being unpatentable over Applicant's admitted prior art in view of Ilhara et al (2002/0092168). Most pertinently, the Examiner asserts that it would be obvious to one of ordinary skill in the art to reduce the pressure load acting on the annular die with an increasing return path (pressure acting upon the annular die (43) by the second end (Wba)) in order for the inner profile to be formed by the backward extrusion process.

The Applicant traverses this rejection and seeks reconsideration in light of the aforementioned amendments and the following arguments:

The claimed process of producing an inner profile in a tube or hollow profile is characterized by the following features:

- providing one of a tube or hollow profile having an internal through opening and a constant cross section over the length thereof;
- inserting the tube or hollow profile into a supporting sleeve, with a first tube end being axially supported
- placing a pressure-loaded annular die on to a second tube end;
- pressing a firming die with an outer profile into the tube or hollow profile from the second tube end for producing the inner profile;
- allowing a return of the annular die under a pressure load in the opposite direction of that of pressing in the forming die;
- wherein the pressure load on the annular die is reduced when an increasing return path

The claimed process has the advantage that a counter-pressure can be built up on the back flowing portion of the tube, thereby forcing the material to flow into the full profile cross-section of the forming die. Thus, an under-filling of the inner profile is prevented so that, as a result, the produced tube or hollow profile has an improved surface quality. For building up the counter-pressure, it is thus crucial according to the invention to provide an annular die which exerts a load to the second tube end during the forming process.

According to the admitted prior art process, the tube or hollow profile is deformed by pressing in a forming die whose outer profile corresponds to the inner profile to be produced. The material displaced as a result of the production of the profile leads to a backward extrusion of the deformed tube. When carrying out this prior art process, there exist limits regarding the profile height, namely the difference between the smallest cross-section and the greatest cross-section of the forming die. With an increasing degree of deformation, the profile filling becomes inadequate and the material does not fully fill the tool contour of the forming die, which results in an unusable product.

Thus, the claimed process of producing an inner profile in a tube or hollow profile differs from the own admitted prior art at least by the following features:

- placing a pressure-loaded annular die onto the second tube end;
- allowing a return of the annular die under a pressure-load in the opposite direction of that of the pressing in the forming die; and
- the pressure-load on the annular die is reduced with an increasing return path.

By means of the annular die which is pressure-loaded to the second tube end, the object of the present invention is solved, namely to propose a process of producing inner profiles, which ensures an improvement in the degree of filling of the mold and which make bigger profile heights safe for production. The counter pressure which is built up by the annular profile forces the material to flow into the full profile

cross-section of the forming die and thus prevents an under-filling during the forming process.

As explained in the previous response to the United States Patent Office, Ilhara (US 2002/0092168 A1) disclosures in Figure 4b and the corresponding description, a cup forming process. The Applicant disagrees with the Examiner's interpretation and asserts that Ilhara clearly fails to show an annular die being pressure-loaded against the tube end, wherein the annular die is returned under a pressure-load in the opposite direction of the forming die (in other words: the annular die exerts a pressure-load onto the tube end while being moved away from the tube), and wherein said pressure-load on the annular die is reduced with an increasing return path. The Applicant respectfully requests reconsideration.

Ilhara teaches the opposite, namely that there is provided a stripper 43 which is simply a carrier member into which the punch 42 is fitted so that the punch 42 can be moved up and down relative to the stripper 43. It is clearly said on page 5, paragraph [0052] of the Ilhara citation that the tapered peripheral wall face Wba will be not constrained by the annular free end face of the tubular body 43a. In other words, the stripper 43 exerts no load onto the work piece.

From this it follows that also a combination of the admitted prior art in view of Ilhara fails to disclose the essential features of the claimed process, namely placing a pressure-loaded annular die onto the second tube end and allowing the return of the annular die under a pressure load, wherein the pressure-load on the annular die is reduced with an increasing return path. Therefore, the claimed process should be regarded to be based on an inventive step over the cited prior art. These limitations are not taught or suggested by the cited art either alone or in combination. The Applicant respectfully requests the Examiner's reconsideration.

Claims 8-11 were rejected under 35 USC 103(a) as being unpatentable over admitted prior art in view of Ilhara in further view of Budrean (4,785,648). The Applicant respectfully traverses these rejections and seeks reconsideration. The Applicant incorporates the aforementioned arguments with regard to the insufficiency of the admitted prior art and Ilhara to teach all the limitations of the claimed invention. The addition of the Budrean reference fails to repair the insufficiency of the prior rejection.

The Budrean reference clearly fails to disclose the claimed features above relating to the pressure loaded annular die. Since none of the cited references, either alone or in combination teach all of the claimed limitations, reconsideration is formally requested.

The Applicant further traverses the Examiner's assertion that it would be inherent to one of ordinary skill in the art that the pressure load acting on the annular die must be reduced with an increasing return path (p3, par 2 of the office action). The Applicant traverses this assertion and notes that one skilled in the art would not find even a hint in the cited or stated prior art that would suggest the use of a pressure-loaded annular die such as claimed by the present invention. The Examiner has provided no support for the statement that reducing the pressure load with an increased return path would be obvious. The Applicant respectfully requests reconsideration and asserts that the claims are presently in condition for allowance.

Allowed Claims

Claim 7 was deemed allowable. The Applicant is grateful for the recognition of the allowable subject matter.

Conclusion

Having overcome all of the objections and rejections set forth in the Office Action, Applicants submit that claims 1 and 7-15 are in a condition for allowance. A Notice of Allowance indicating the same is therefore earnestly solicited. The Examiner is invited to telephone the Applicants' undersigned attorney at (248) 433-7200 if any unresolved matters remain.

Respectfully submitted,

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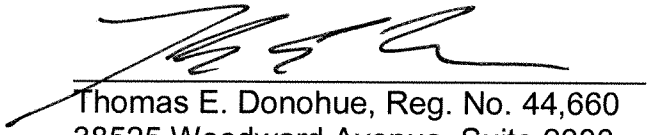

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